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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/583,115

06/16/2006

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4702-45

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03/18/2008

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EXAMINER

LEE, RIP A

ART UNIT

PAPER NUMBER

1796

MAIL DATE

DELIVERY MODE

03/18/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/583,115 | Applicant(s) KIMBERLEY ET AL. | |
| | Examiner RIP A. LEE | Art Unit 1796 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-32 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 17-32 is/are rejected.
- 7) ☒ Claim(s) 17, 25 and 26 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07-21-2006</u> . | 6) <input type="checkbox"/> Other: ____. |

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DETAILED ACTION

Claim Objections

1. Claim 17 is objected to because of the following informalities: In line 2 of the claim, please replace “propylene and” should be replaced with “propylene or.” Appropriate correction is required.
2. Claim 17 is objected to because of the following informalities: In line 3 of the claim, it appears that “which” should be replaced with “with.” Appropriate correction is required.
3. Claim 25 is objected to because of the following informalities: In line 5 of the claim, please replace “and combinations” should be replaced with “or combinations.” Appropriate correction is required.
4. Claim 25 is objected to because of the following informalities: In line 10 of the claim, please replace “siloxylalkyl etc. having” with “and siloxylalkyl having.” Appropriate correction is required.
5. Claim 25 is objected to because of the following informalities: In line 17 of the claim, please replace “and combinations” should be replaced with “or combinations.” Appropriate correction is required.
6. Claim 26 is objected to because of the following informalities: In line 5 of the claim, please replace “and combinations” should be replaced with “or combinations.” Appropriate correction is required.
7. Claim 26 is objected to because of the following informalities: In line 16 of the claim, please replace “and combinations” should be replaced with “or combinations.” Appropriate correction is required.

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Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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11. Claims 17-20 and 22-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Gauthier *et al.* (U.S. 6,777,366).

Gauthier *et al.* discloses a process for making supported catalysts for olefin polymerization. Particulate silica with an average diameter of 20-60 μm (col. 10, line 23) is the inert carrier, and at this particle size, the material is substantially a powder (see Figures). The catalyst is prepared by combining MAO with the support, followed by introduction of a metallocene component (col. 14, lines 15-64). At this point, the catalyst is contacted with hexane and then mineral oil (col. 15, lines 1-14), both of which are liquid hydrocarbons. There is all indication that the catalyst remains in powder form since silica is not deteriorated in the process.

12. Claims 31 and 32 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gauthier *et al.*

The discussion of the disclosures of the prior art from the previous paragraph of this office action is incorporated here by reference. Gauthier *et al.* is silent with regard to polymer fines in the polymerization system. However, in view of the fact that the process and catalyst are characterized by substantially the same features recited in the instant claim, a reasonable basis exists to believe that the polymerization is inherently associated with reduction of fines as recited in the instant claims. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

13. Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gauthier *et al.* in view of DeChellis *et al.* (U.S. 5,405,922).

Gauthier *et al.* is not particularly limiting in the type of polymerization inventive catalysts may be used. At the time of the instant invention, use of supported catalysts in gas phase polymerization was well-known. One having ordinary skill in the polymer art would have found it obvious to use a supported catalyst, such as that disclosed in Gauthier *et al.* in a gas phase

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polymerization because gas phase polymerization requires a supported catalyst. While Gauthier *et al.* does not show a gas phase reaction vessel, DeChellis *et al.* shows that such polymerization processes are carried out in a fluidized bed reactor. Thus, it would have been obvious to one having ordinary skill in the art to use a fluidized bed reactor to carry out a gas phase polymerization using the catalysts of Gauthier *et al.*, and since these are known processes, the skilled artisan would have expected such an embodiment to work with a high degree of success. Since the process and catalyst are characterized by substantially the same features recited in the instant claim, a reasonable basis exists to believe that the polymerization is inherently associated with reduction of fines as recited in the instant claims. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

14. Claims 17 and 20-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Ernst *et al.* (WO 01/25296).

Ernst *et al.* discloses a process for polymerization of olefin in the presence of a supported catalyst comprising inert carrier, MAO, and metallocene (examples 1-3). The catalyst powder is placed into a catalyst feeder and then rinsed into the reaction vessel with liquid propylene (example 4).

15. Claim 21 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ernst *et al.*

The discussion of the disclosures of the prior art from the previous paragraph of this office action is incorporated here by reference. There is no indication in the prior art as the amount of liquid hydrocarbon present in the pore volume of the inert support during the contacting stage. However, in view of the fact that the hydrocarbon is used as a sweep to introduce catalyst into the reactor and that the contact time is minimal, a reasonable basis exists to believe that the amount of hydrocarbon entering the pore of the supported catalyst is well within the claimed amount. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d.

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67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

16. Claims 31 and 32 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Ernst *et al.*

Ernst *et al.* teaches that polymerization using inventive supported catalysts is carried out without reactor fouling and the resulting polymer has low fines content. The reference is silent with respect to quantification of the fines content (page 20). However, in view of the fact that the process and catalyst are characterized by substantially the same features recited in the instant claim, a reasonable basis exists to believe that the polymerization is inherently associated with reduction of fines as recited in the instant claims. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

17. Claims 17-19, 22-24, 31, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Speca *et al.* (U.S. 5,688,734).

Speca *et al.* teaches a process for polymerization of olefin in the presence of supported metallocene catalyst. Where catalysts are dried to remove toluene, the solvent used to deliver metallocene/aluminoxane to the support, the supported catalyst system is further contacted with a volume of hexane between 0.5 to 1 times the pore volume of the supported catalyst (col. 9, lines 30-50). Reactions are carried out in a gas phase reactor with fluidizing medium (col. 11, line 24-29). Supported catalysts prepared in this fashion are amenable for prepolymerization which leads to little reactor fouling compared with parallel reactions carried out in the presence of non-prepolymerized catalyst (col. 16, lines 5-12). Speca *et al.* is silent with regard to quantifying the amount of polymer fines in the polymerization system, however, in view of the fact that the process and catalyst are characterized by substantially the same features recited in the instant claim, a reasonable basis exists to believe that the polymerization is inherently associated with reduction of fines as recited in the instant claims. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re*

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Fitzgerald, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

18. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Specia et al.*

The discussion of the disclosures of the prior art from the previous paragraph of this office action is incorporated here by reference. One having ordinary skill in the art gleans from the disclosure that the amount of inert hydrocarbon governs the amount of monomer gas dissolved within the pores of the supported catalyst particle (col. 10, lines 35-40), and this in turn, governs polymer particle size (see for instance, col. 16, lines 5-12). And while *Specia et al.* does not disclose contact of inert hydrocarbon at a level of up to 10% of the pore volume, as indicated in the instant claim, it is the examiner's position that the amount of hydrocarbon added to the support is a result-effective variable (MPEP 2144.5) since the amount used clearly affects the amount of monomer gas dissolved in the support. Hence, the choice of a particular amount of hydrocarbon solvent, such as the amount in present claims, is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art.

19. Claims 17-25 and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Canich et al.* (U.S. 5,057,475) in view of *Specia et al.*

Canich et al. discloses polymerization of olefin in the presence of a supported constrained group metallocene-like catalyst such as $\text{Me}_2\text{Si}(\text{C}_5\text{Me}_4)(\text{N-}t\text{-Bu})\text{ZrCl}_2/\text{MAO}$ (Table 1, col. 11, line 15, example 1). Preparation of supported catalyst and its use in prepolymerization is disclosed in col. 15, lines 24-67. Polymerization reactions are carried out in a fluidized gas phase reactor (col. 16, lines 29-32). *Canich et al.* does not disclose treatment of supported catalyst with hydrocarbon solvent.

The prior art of *Specia et al.* also relates to polymerization of olefin in the presence of supported catalysts. Where catalysts are dried to remove toluene, such as that process disclosed in *Canich et al.*, the supported catalyst system is further contacted with a volume of hexane between 0.5 to 1 times the pore volume of the supported catalyst (col. 9, lines 30-50). Supported catalysts prepared in this fashion are amenable for prepolymerization which leads to little reactor

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fouling compared with parallel reactions carried out in the presence of non-prepolymerized catalyst (col. 16, lines 5-12), *Specia et al.* further discloses that introduction of inert hydrocarbon governs the amount of monomer gas dissolved within the pores of the supported catalyst particle (col. 10, lines 35-40), and this in turn, governs polymer particle size (see for instance, col. 16, lines 5-12).

The combination of teachings would have suggested to one having ordinary skill in the art that the process disclosed in *Specia et al.* is general and may be practiced with any supported metallocene catalyst. One having ordinary skill in the art would find strong motivation to modify the process of *Canich et al.* by contacting supported catalyst with inert hydrocarbon in order to obtain a controlled polymer particle size with the added benefit of reduction of reactor fouling, as taught in *Specia et al.* Therefore, it would have been obvious to one having ordinary skill in the art to modify the process of *Canich et al.* as per the method of *Specia et al.*, and the skilled artisan would have expected the such a modification to work with a high degree of success.

While *Specia et al.* does not disclose contact of inert hydrocarbon at a level of up to 10% of the pore volume, as indicated in the instant claim, it is the examiner's position that the amount of hydrocarbon added to the support is a result-effective variable (MPEP 2144.5) since the amount used clearly affects the amount of monomer gas dissolved in the support. Hence, the choice of a particular amount of hydrocarbon solvent, such as the amount in present claims, is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art.

The references are silent with regard to quantifying the amount of polymer fines in the polymerization system, however, in view of the fact that the process and catalyst are characterized by substantially the same features recited in the instant claim, a reasonable basis exists to believe that the polymerization is inherently associated with reduction of fines as recited in the instant claims. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

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20. Claims 17-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen *et al.* (U.S. 5,834,393) in view of Specca *et al.*

Jacobsen *et al.* teaches preparation of a supported catalyst system comprising a constrained group metallocene-like catalyst and a borate activator containing at least one active hydrogen. The catalyst system $\text{Me}_2\text{Si}(\text{C}_5\text{Me}_4)(\text{N-}t\text{-Bu})\text{Zr}(\eta^4\text{-C}_5\text{H}_8)/[\text{Et}_3\text{NH}][\text{B}(\text{C}_6\text{F}_5)(\text{C}_6\text{H}_4\text{-OH})]$ is exemplary (example 20). Inventive supported catalysts can be subjected to prepolymerization (col. 22, line 63), and they are sufficiently stable for use in gas phase polymerization (col. 23, lines 35-55). The working examples of Jacobsen *et al.* show use of catalysts in slurry polymerization reactions and therefore, the reference is silent with respect to details of gas phase polymerization.

The prior art of Specca *et al.* relates to gas phase polymerization of olefin. As an additional step in preparation of supported catalyst, such as that disclosed in Jacobsen *et al.*, the supported catalyst system is further contacted with a volume of hexane between 0.5 to 1 times the pore volume of the supported catalyst (col. 9, lines 30-50). Supported catalysts prepared in this fashion are further subjected to prepolymerization which leads to little reactor fouling compared with parallel reactions carried out in the presence of non-prepolymerized catalyst (col. 16, lines 5-12). Specca *et al.* further discloses that introduction of inert hydrocarbon governs the amount of monomer gas dissolved within the pores of the supported catalyst particle (col. 10, lines 35-40), and this in turn, governs polymer particle size (see for instance, col. 16, lines 5-12).

The combination of teachings would have suggested to one having ordinary skill in the art that the process disclosed in Specca *et al.* is general and may be practiced with any supported metallocene catalyst. One having ordinary skill in the art would find strong motivation to modify the process of Jacobsen *et al.* by contacting supported catalyst with inert hydrocarbon in order to obtain a controlled polymer particle size with the added benefit of reduction of reactor fouling, as taught in Specca *et al.* Therefore, it would have been obvious to one having ordinary skill in the art to modify the process of Jacobsen *et al.* as per the method of Specca *et al.*, and the skilled artisan would have expected the such a modification to work with a high degree of success.

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While Speca *et al.* does not disclose contact of inert hydrocarbon at a level of up to 10% of the pore volume, as indicated in the instant claim, it is the examiner's position that the amount of hydrocarbon added to the support is a result-effective variable (MPEP 2144.5) since the amount used clearly affects the amount of monomer gas dissolved in the support. Hence, the choice of a particular amount of hydrocarbon solvent, such as the amount in present claims, is a matter of routine experimentation and would have been well within the skill level of, and thus obvious to, one of ordinary skill in the art.

The references are silent with regard to quantifying the amount of polymer fines in the polymerization system, however, in view of the fact that the process and catalyst are characterized by substantially the same features recited in the instant claim, a reasonable basis exists to believe that the polymerization is inherently associated with reduction of fines as recited in the instant claims. Since the PTO can not conduct experiments, the burden of proof is shifted to the Applicants to establish an unobviousness difference. *In re Fitzgerald*, 619 F.2d. 67, 205 USPQ 594 (CCPA 1980). See MPEP § 2112-2112.02. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977).

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Primary Examiner, Art Unit 1796

March 2, 2008